

ABSTRACT

An adaptive electric car or other vehicle with potentially better performance – power, efficiency, range – than a gasoline vehicle, at a competitive cost. The motor control system can dynamically adapt to the vehicle’s operating conditions (starting, accelerating, turning, braking, cruising at high speeds) and other inputs and parameters. That consistently provides better performance. Isolating the vehicle’s motor or generator electromagnetic circuits allows effective control of more independent parameters. That gives great freedom to optimize. Adaptive motors and generators for an electric vehicle are cheaper, smaller, lighter, more powerful, and more efficient than conventional designs. An electric vehicle with in-wheel adaptive motors delivers high power with low unsprung mass and high torque and power-density. Total energy management of the vehicles entire electrical system allows for large-scale optimization. An adaptive architecture improves performance of a wide variety of vehicles, particularly those that need optimal efficiency over a range of operating conditions.